Heterotopic Pancreas in the Common Bile Duct, with a Review of the Literature

Tatsuaki Sumiyoshi¹, Yasuo Shima¹, Takehiro Okabayashi¹, Takuhiro Kohsaki², Atsushi Kigi³, Jun Iwata³, Akihito Kozuki¹, Teppei Tokumaru¹, Isao Nishimori² and Sojiro Morita⁴

Abstract

A 65-year-old man presented with upper abdominal pain and was suspected of having choledocholithiasis. Endoscopic extraction of the stone was performed; however, a round filling defect in the common bile duct (CBD) persisted. Subsequent cholangioscopy showed the presence of a papillary tumor in the CBD, and the lesion was removed via the Whipple procedure. Microscopically, the papillary lesion was composed of pancreatic tissue in the submucosal layer of the CBD and therefore diagnosed as reflective of heterotopic pancreas. This is only the seventh case of heterotopic pancreas in the CBD reported in the English literature.

Key words: heterotopic pancreas, common bile duct, papillary tumor

(Intern Med 53: 2679-2682, 2014)
(DOI: 10.2169/internalmedicine.53.3007)

Introduction

Heterotopic pancreas is defined as the presence of pancreatic tissue outside its normal location without any connection to the normal pancreas (1-11). This condition is very rarely detected during surgery, accounting for 0.2% of cases of laparotomic exploration, compared to 0.55-13.7% of autopsies (11). It is primarily observed in the duodenum, stomach, jejunum, Meckel’s diverticulum and ileum, being less frequently detected in the omentum, liver, spleen, gallbladder and papilla of Vater (3). The common bile duct (CBD) has also been reported to be a site of origin of heterotopic pancreas, although such cases are very rare (1-6). We herein report a case of heterotopic pancreas in the CBD that mimicked a biliary papillary tumor and discuss the findings of a review of literature.

Case Report

A 65-year-old man with a history of laparoscopic cholecystectomy for gall-bladder stones and endoscopic extraction of a common bile duct stone presented with upper abdominal pain. Laboratory test results showed the following findings: total bilirubin, 4.9 mg/dL; serum alkaline phosphatase, 799 IU/L; serum amylase, 414 U/L; and serum C-reactive protein, 12.2 mg/dL. Tests for both carcinoembryonic antigen and carbohydrate 19-9 were negative. The patient was subsequently diagnosed with acute cholangitis and pancreatitis due to recurrence of choledocholithiasis based on his medical history and the results of the blood test. Endoscopic retrograde cholangiography (ERC) showed filling defects in the middle and inferior portions of the CBD (Fig. 1a), and endoscopic extraction of the bile duct stone was performed. However, even after the stone was removed, ERC showed a round-shaped filling defect in the inferior portion of the CBD (Fig. 1b), despite the absence of residual bile duct stones on contrast-enhanced computed tomography (CT). Subsequent cholangioscopy demonstrated a small papillary lesion in the inferior portion of the CBD (Fig. 1c), and a pathologic examination of the endoscopic biopsy specimen showed biliary epithelial cells without nuclear atypia; how-
ever, these findings were insufficient to establish a diagnosis. Although a close follow-up was considered as a treatment option, surgery was ultimately planned, considering the possibility of a malignant biliary tumor. Before surgery, the patient’s total bilirubin, serum alkaline phosphatase and serum amylase levels returned to normal. At laparotomy, the CBD was dilated to 12 mm in diameter, and complete resection of the lesion via the Whipple procedure was performed. Macroscopically, the papillary lesion was located in the inferior portion of the bile duct (Fig. 2a). Microscopically, the lesion was found to be composed of pancreatic tissue in the submucosal layer of the bile duct (Fig. 2b), and the pancreatic tissue was composed of pancreatic acini, ducts, and islets of Langerhans (Fig. 2c). Based on these findings, the lesion was diagnosed as ectopic pancreatic tissue in the CBD. The patient recovered well after the surgery, with no ab-
Spherical polypoid in shape in two patients and nodular in one patient. The lesions ranged from 3 mm to 1 cm, with the diameter in the present case being the smallest. Morphologically, the lesions were classified as differentiated heterotopic pancreatic tissue containing acini, ducts or islets; (2) incompletely differentiated heterotopic pancreatic tissue composed predominantly of ducts and a few acini; and (3) adenomyoma which is composed of smooth muscle tissue and ducts only (4). In the current case, the lesion was classified as differentiated heterotopic pancreatic tissue. As for the origin of such tissue, ectopic pancreas usually occurs in the upper gastrointestinal tract, with the most common site being the duodenum (27.5%), followed by the stomach (25-35%) and jejunum (15.9%) (10); cases involving the CBD are extremely rare. In the English literature, only six such cases have been reported to date (Table). A literature review revealed that the mean patient age in the reported patients, including the current patient, and biliary tumors were suspected in four patients. Tsunoda et al. (3) reported that heterotopic pancreas was not diagnosed preoperatively in any of the seven patients, and biliary tumors were obtained a pathological diagnosis using the frozen section technique at the time of surgery is of great benefit in avoiding unnecessary extensive surgery. However, in the present case, the heterotopic pancreas was located in the inferior portion of the CBD in the pancreatic head, and the lesion was small in size. Therefore, it was difficult to perform a peroperative biopsy. Currently, it is very difficult to obtain a correct preoperative diagnosis of this disease, and further investigation is necessary to determine strategies to overcome this problem. Although an extremely rare entity, heterotopic pancreas should be considered in the differential diagnosis of small tumorous lesions in the CBD.

**Discussion**

Heterotopic pancreas was first described by Schultz in 1727, and the first histopathologically confirmed case was reported by Klob in 1859 (11). Although the etiology underlying the development of heterotopic pancreas has not yet been determined, it has been suggested that the transplantation and/or adhesion of embryonic pancreatic cells to adjacent structures may occur during the rotation of the pancreatic primordia, thus resulting in the development of heterotopic pancreas (3). Heterotopic pancreas is classified into three main types based on the histological features: (1) differentiated heterotopic pancreatic tissue containing acini, ducts or islets; (2) incompletely differentiated heterotopic pancreatic tissue composed predominantly of ducts and a few acini; and (3) adenomyoma which is composed of smooth muscle tissue and ducts only (4). In the current case, the lesion was classified as differentiated heterotopic pancreatic tissue. As for the origin of such tissue, ectopic pancreas usually occurs in the upper gastrointestinal tract, with the most common site being the duodenum (27.5%), followed by the stomach (25-35%) and jejunum (15.9%) (10); cases involving the CBD are extremely rare. In the English literature, only six such cases have been reported to date (Table). A literature review revealed that the mean patient age in these cases was 54.7 years, ranging from 32 to 77 years. Two patients were men and five were women. The most common symptom was abdominal pain, observed in five patients, and biliary duct dilatation was present in all seven patients. The longest diameter of the heterotopic pancreas ranged from 3 mm to 1 cm, with the diameter in the present case being the smallest. Morphologically, the lesions were a spherical polypoid in shape in two patients and nodular in shape in one patient.

Obtaining a preoperative diagnosis of this condition, however, can be difficult (4). In the current case, the serum amylase level was elevated on admission, which may have been partially due to the effects of the heterotopic pancreas. However, concomitant bile duct stones can induce pancreatitis, and the influence of heterotopic pancreas on the incidence of pancreatitis is unclear. Preoperative biopsies are thought to be ineffective in such cases, as heterotopic pancreatic tissue usually appears in the submucosal layer (3-6, 8). Preoperative biopsies were performed in two of the reported patients, including the current patient, and heterotopic pancreas was not detected in either case. Furthermore, heterotopic pancreas was not diagnosed preoperatively in any of the seven patients, and biliary tumors were suspected in four patients. Tsunoda et al. (3) reported that obtaining a pathological diagnosis using the frozen section technique at the time of surgery is of great benefit in avoiding unnecessary extensive surgery. However, in the present case, the heterotopic pancreas was located in the inferior portion of the CBD in the pancreatic head, and the lesion was small in size. Therefore, it was difficult to perform a peroperative biopsy. Currently, it is very difficult to obtain a correct preoperative diagnosis of this disease, and further investigation is necessary to determine strategies to overcome this problem. Although an extremely rare entity, heterotopic pancreas should be considered in the differential diagnosis of small tumorous lesions in the CBD.

**The authors state that they have no Conflict of Interest (COI).**

**References**

1. De Castro Barbosa JJ, Dockerty MB, Waugh JM. Pancreatic heterotopia; review of the literature and report of 41 authenticated sur-


© 2014 The Japanese Society of Internal Medicine
http://www.naika.or.jp/imonline/index.html